



Renewed for greater ease of use

Thank you for using KHK gear products, We appreciate your patronage. We have issued the Stock Gear Master Catalog "KHK2021". This time, we have significantly expanded the lineup of standard secondary operations for stock gears such as J Series and Hardened Plus, and enhanced the fastening series such as F, R and E series that cater to various applications. KHK's mission is to offer quality products that build Customer Trust and Satisfaction. We look forward to serving you.

Kohara Gear Industry Co.,Ltd.
Toshiharu Kohara, President



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NEW

JIS Grade 0 Ground Spiral Miter M M S G Q

All machining datum planes are cut and locating the center is made easy to maintain accuracy KHK's highest-grade miter gears with excellent quietness

JIS B1704: 1978 Grade 0

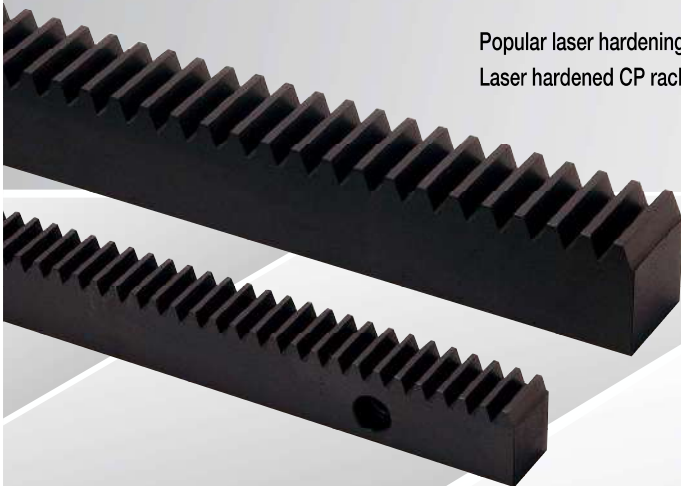
Please see Page 306 for more details.



Laser Hardened CP Racks SRCPF-HL + *J Series*

Popular laser hardening is standardized for CP racks
Laser hardened CP racks are now classified as the J Series

Please see Page 292
for more details.



J Series The lineup has been significantly expanded

SUKB Assembled PSA Spur Gears

PSUKB

These products have SUKB stainless hubs attached to PSA plastic spur gears. They provide excellent tightening strength in the mounting hole as well as economic efficiency.

Please see Page 181 for more details.



* The bolts are temporarily fixed. They need to be tightened by the customer. (regulated torque)

KS/KSG KSSCP/KSCPG

The KS style thermal refined spur gears, the KSG style ground spur gears, the KSSCP style thermal refined spur gears, and the KSCPG style ground spur gears have all been added to the J series



Please see Page 98 for more details.

ZSTP

EU-specification (spiral angle: 19°31'41") ground helical gears have been added to the J series



Please see Page 262 for more details.

SUN/AN/PN

Stainless steel, CAC702 aluminum bronze and nylon screw gears have been added to the J series



Please see Page 369 for more details.

GC

Gear couplings (inner hubs only) have been added to the J series



Please see Page 462 for more details.

焼入+プラス

Induction Hardening Service

J Series Now Supported

Hardened Plus has been added to the J series.

Refer to the following for details regarding delivery times.



Hardened Plus

Hardening is provided as an additional service to standard products when ordered. Products with H at the end of the Catalog No. support Hardened Plus.

- Quick delivery, hardened completed in 4 working days
- The surface durability is increased about 4 times

Induction hardening specification

Area: Tooth surface hardened
Hardness: HRC50 to 60

- Hardness and depth of gear-teeth induction hardening
- The hardening method and the state of the hardened teeth area vary depending on the size of gears. Note that hardening specifications of Hardening Plus above will be near the standard pitch diameter of the gear.

Note: The gear precision decreases after hardening. The bore dimension tolerance H7 will also be degraded.

Target Products

Various Standard Product / J Series
SS/SSA/SSCP Spur Gears
KS/KSSCP Thermal Refined Spur Gears

Ordering Method and Delivery Date

- Standard Product Please specify: Catalog No. + H.
Example: Catalog No.: SS3-30, when hardening is added ⇒ SS3-30H
Production is completed by the manufacturer in **4 working days** excluding the day ordered
- J Series Please specify: Catalog No. + H + J + BORE.
Example: Catalog No.: SS4-15, when hardening is added ⇒ SS4-15HJ25
m1 to 3 Production is completed by the manufacturer in **6 working days** excluding the day ordered
m4 to 8 Production is completed by the manufacturer in **11 working days** excluding the day ordered

Precautions


- As available-on-request products, these require a lead-time for shipping of 4 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations.
- The bore diameter distorts due to hardening.
- Black oxide treatment cannot be performed after hardening.
- The surface durability values shown in the table are calculated values according to the assumed usage conditions. Please calculate the actual surface durability in the KHK Web Catalog.

Semi-Custom Stock Gears

J Series now supported

Large selection of standardized Coarse Pitch gears are in the Catalog Allowing for efficient designing and quick delivery

Supported Products

SSG Ground Spur Gears 
m4/5/6/8/10 / No. of Teeth 20 to 120

SS Spur Gears 
m4/5/6/8/10 / No. of Teeth 26 to 120



Ordering Method

- Semi-Custom Standard Product
Example: SS5-80S
- Semi-Custom Standard Product J Series: Catalog No. + J + BORE
Example: SS5-80SJ40

Delivery Date

- Semi-Custom Standard Product
SS Spur Gears : About 15 business days after the order is received
SSG Ground Spur Gears: About 25 business days after the order is received
- Semi-Custom Standard Product J Series
SS Spur Gears : About 25 business days after the order is received
SSG Ground Spur Gears : About 35 business days after the order is received

- Non-standard secondary operations are available at "KHK Quick-Mod Gears"
If there are no standards for the semi-custom J Series, the order will be machined separately according to the specifications.

* Semi-custom standard products are made to order based on catalog products. The price and delivery date will be quoted separately.

Spur Gears

MSG/MSGB Ground Spur Gears  Material: SCM415 m1-4 Page 42	KSG Ground Spur Gears NEW  Material: SCM440 m1-3 Page 52	SSGS Ground Spur Pinion Shafts  Material: S45C m1.5-3 Page 54	SSG Ground Spur Gears NEW  Material: S45C m0.5-10 Page 56	SSG F Series Ground Spur Gears  Material: S45C m2-3 Page 74	SSG E Series Ground Spur Gears NEW  Material: S45C m1.5-6 Page 80	SSG R Series Ground Spur Gears  Material: S45C m1.5-6 Page 90
Pinion gear for Nabtesco GH Series NEW  Material: S45C/SCM440 m3-6 (CP10-20) Page 92	SSAG Ground Spur Gears  Material: S45C m1-6 Page 94	KS-H Hardened Spur Gears NEW  Material: SCM440 m1.5-5 Page 98	KS Thermal Refined Spur Gears NEW  Material: SCM440 m1.5-5 Page 98	SSS Spur Pinion Shafts  Material: S45C m1, 1.5 Page 100	SS-H Hardened Spur Gears NEW  Material: S45C m1-6 Page 104	SS Spur Gears NEW  Material: S45C m0.5-10 Page 102
SS F Series Spur Gears  Material: S45C m1.5-3 Page 128	SSA-H Hardened Spur Gears  Material: S45C m1-5 Page 136	SSA Spur Gears  Material: S45C m1-5 Page 136	SSA F Series Spur Gears  Material: S45C m2-3 Page 144	SSY Spur Gears  Material: S45C m0.8, 1 Page 148	SSAY Spur Gears  Material: S45C m1 Page 152	SUS/SUSA Stainless Steel Spur Gears  Material: SUS303 m1-4 Page 154
SUSF F-Loc Gears  Material: SUS303 m0.5, 1 Page 160	DSF F-Loc Gears  Material: Polyacetal (SUS303) m0.5, 1 Page 162	NSU Plastic Spur Gears with Steel Core  Material: MC602ST (S45C) m1-3 Page 164	PU Plastic Spur Gears with Steel Core  Material: MC901 (SUS303) m1-2 Page 168	PS/PSA Plastic Spur Gears  Material: MC901 m1-3 Page 170	SUKB Stainless Steel Hubs PSA Dedicated  Material: SUS303 ø30-100 Page 180	PSUKB SUKB Assembled PSA Spur Gear NEW  Material: MC901/SUS303 m2-3 Page 181
DS Injection Molded Spur Gears  Material: Duracon (R) (M90-44) m0.5-1 Page 182	BB Sintered Metal Bushings  Material: Oil-free copper alloy ø5-8 Page 184	BSS Spur Gears  Material: Free cutting brass (C3604) m0.5-1 Page 186	SSR Steel Ring Gears (Spur Gears)  Material: S45C m2-3 Page 188			


Helical Gears

KHG Ground Helical Gears  Material: SCM440 m1-3 Page 194	SH Helical Gears  Material: S45C m2, 3 Page 204
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Internal Gears

SI Steel Internal Gears  Material: S45C m0.5-3 Page 210	SIR Steel Ring Gears (Spur Gears)  Material: S45C m2-3 Page 212
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SSG Ground Spur Gears
NEW  **J S**

Product Photo → **Catalog Number** → **Product Name**

Icon Mark → **Material** → **Page**

Material: S45C
Size: m0.5-10 Page 56

NEW New Pproducts **J** J Series **F** F Series
R R Series **H** Hardened Plus **S** Semi-Custom **E** E Series

Racks

MGRF/MRGFD Hardened Ground Racks  Material: SCM415 m1.5-3 Page 224	KRGF-H/KRGFD-H Hardened Ground Racks  Material: SCM440 m1.5-3 Page 226	KRG/KRGF/KRGFD Thermal Refined Ground Racks NEW  Material: SCM440 m1-3 Page 228	SRG/SRGF/SRGFD/SRGFK Hardened Ground Racks  Material: S45C m0.5-6 Page 230	KRF-H/KRFD-H Hardened Racks  Material: SCM440 m1.5-5 Page 232	SRF-H/SRFD-H Hardened Racks  Material: S45C m1.5-6 Page 234	SRF-HL/SRFD-HL Laser Hardened Racks  Material: S45C m1.5-6 Page 236
KRF/KRFD Thermal Refined Racks  Material: SCM440 m1.5-5 Page 238	SRAF/SRAFD/SRAFK Square Racks  Material: S45C m1.5-4 Page 240	SR Racks  Material: S45C m0.5-10 Page 242	SRF Steel Racks with Machined Ends  Material: S45C m0.5-10 Page 243	SRFD/SRFK Steel Racks with Bolt Holes  Material: S45C m0.5-6 Page 244	SUR/SURF/SURFD Stainless Steel Racks  Material: SUS304 m1-4 Page 246	DRF/DRFD/DRFK Plastic Racks  Material: Polyacetal m1-3 Page 248
PR/PRF Plastic Racks  Material: MC901 m1-3 Page 250	BSR Racks  Material: Free cutting brass (C3604) m0.5-10 Page 251	SRO/SROS Round Racks  Material: S45C m1-5 Page 252	SURO Stainless Steel Round Racks  Material: SUS303 m1-3 Page 253	DR Molded Flexible Racks  Material: Duracon (R) (M25-44) m0.8-2 Page 254	SSDR/ARL/SRS Rack Clamps for Pinion/Rack Guide Rails For Molded Flexible Racks  Material: S45C, etc. Page 254	KRHG/KRHGF/KRHGFD Ground Helical Racks  Material: SCM440 m1-3 Page 256
SRH/SRHFD/SRHFD Helical Racks  Material: S45C m2, 3 Page 258	SRHEF Helical Racks  Material: S45C m1.5-6 Page 260	SHE Helical Gears  Material: S45C m1.5-6 Page 260	ZST/ZSTD Hardened Ground Helical Racks  Material: DIN C45 (S45C equivalent) m2-6 Page 262	ZSTP Ground Helical Gears NEW  Material: SCM440 m0.8-2 Page 262	ZST-GL Assembly Gauges  Material: S45C m1.5-6 Page 264	

CP Racks & Pinions

KTSCP Tapered Pinions  Material: SCM440 CP5, 10 Page 272	STRCPF/STRCPFD Tapered Racks  Material: S45C CP5, 10 Page 272	MSCPG Made to Order Ground Spur Gears  Material: SCM415 CP5, 10 Page 274	MRGCPF/MRGCPFD Hardened Ground Racks  Material: SCM415 CP5, 10 Page 274	KSCPG Ground Spur Gears NEW  Material: SCM440 CP5, 10 Page 276	KRGCPF-H/KRGCPFD-H Hardened Ground Racks  Material: SCM440 CP5, 10 Page 276	KRGCP/KRGCPF/KRGCPFD Thermal Refined Ground Racks NEW  Material: SCM440 CP5, 10 Page 278
SSCPGS Ground Spur Pinion Shafts  Material: S45C CP5, 10 Page 280	SSCPG Ground Spur Gears  Material: S45C CP5-20 Page 280	SRGCP/SRGCPF/SRGCPFD Hardened Ground Racks  Material: S45C CP5-20 Page 282	KRCPF-H/KRCPFD-H Hardened Racks  Material: SCM440 CP5, 10 Page 284	KSSCP Thermal Refined Spur Gears NEW  Material: SCM440 CP5, 10 Page 286	KRCPF/KRCPFD Thermal Refined Racks  Material: SCM440 CP5, 10 Page 286	SSCP Spur Gears NEW  Material: S45C CP2.5-20 Page 288
SRCPF-H/SRCPFD-H Hardened Racks  Material: S45C CP5-20 Page 290	SRCPF-HL/SRCPFD-HL Laser hardened  Material: S45C CP5-20 Page 292	SRCP/SRCPF/SRCPFD/SRCPFK Racks  Material: S45C CP2.5-20 Page 294	SUSCP Stainless Steel Spur Gears  Material: SUS303 CP5, 10 Page 296	SURCPF/SURCPFD Stainless Steel Racks  Material: SUS304 CP5, 10 Page 296	SROCP Round Racks  Material: S45C CP2.5-10 Page 298	FRCP Metal Flexible Racks  Material: SS400 CP5 Page 298

Miter Gears


MMSGQ Ground Spiral Miter Gears <i>NEW</i>	MMSG Ground Spiral Miter Gears	MSG Ground Spiral Miter Gears	MMSA/MMSB Finished Bore Spiral Miter Gears	MMS Spiral Miter Gears	SMS Spiral Miter Gears	SMA/SMB/SMC Finished Bore Miter Gears
Material: SCM415 m2-4 Page 306	Material: SCM415 m2-4 Page 308	Material: S45C m1-5 Page 310	Material: SCM415 m1-10 Page 312	Material: SCM415 m2-5 Page 314	Material: S45C m1-8 Page 316	Material: S45C m1-8 Page 318
MM Miter Gears	LM Sintered Metal Miter Gears	SM Miter Gears	SAM Angular Miter Gears	SUM Stainless Steel Miter Gears	SUMA Finished Bore Stainless Steel Miter Gears	PM Plastic Miter Gears
Material: SCM415 m2-5 Page 320	Material: SMF5040 m0.8-1.5 Page 320	Material: S45C m1-8 Page 322	Material: S45C m1.5-3 Page 324	Material: SUS303 m1-4 Page 326	Material: SUS303 m1-4 Page 326	Material: MC901 m1-4 Page 328
DM Injection Molded Miter Gears	BB Sintered Metal Bushings	Nissel KSP Ground Spiral Miter				
Material: Duracon (P) (M90-44) m0.5-1.5 Page 328	Material: Oil-free copper alloy φ5-8 Page 330	Material: SCM415 m1.5-6 Page 364				

Bevel Gears

MHP High-Ratio Hypoid Gears Gear Ratio 15-60	MBSG Ground Spiral Bevel Gears Gear Ratio 2	SBSG Ground Spiral Bevel Gears Gear Ratio 1.5-3	MBSA/MBSB Finished Bore Spiral Bevel Gears Gear Ratio 1.5-3	SBS Spiral Bevel Gears Gear Ratio 1.5-4	SB Bevel Gears Gear Ratio 1.5-4	SBY Bevel Gears Gear Ratio 2-4
Material: SCM415 m1, 1.5 Page 336	Material: SCM415 m2-4 Page 340	Material: S45C m2-4 Page 342	Material: SCM415 m2-6 Page 344	Material: S45C m1-5 Page 348	Material: S45C m1-6 Page 352	Material: S45C m5-8 Page 352
SB Steel Bevel Gears & Pinion Shafts Gear Ratio 5	SUB Stainless Steel Bevel Gears Gear Ratio 1.5-3	PB Plastic Bevel Gears Gear Ratio 1.5-3	DB Injection Molded Bevel Gears Gear Ratio 2	BB Sintered Metal Bushings	Nissel KSP Ground Spiral Bevel Gears Gear Ratio 1-2	
Material: S45C m1.5-3 Page 356	Material: SUS303 m1.5-3 Page 358	Material: MC901 m1-3 Page 360	Material: Duracon (P) (M90-44) m0.5-1 Page 362	Material: Oil-free copper alloy φ5-6 Page 362	Material: SCM415 m1.5-6 Page 364	

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Catalog Number

MMSGQ

Product Name

Ground Spiral Miter Gears

NEW

Icon Mark

Material

Material: SCM415

NEW New Products

J J Series **F** F Series

R R Series **H** Hardened Plus **S** Semi-Custom **E** E Series

Screw Gears

SN Screw Gears	SUN Stainless Steel Screw Gears	AN Screw Gears	PN Plastic Screw Gears
Material: S45C m1-4 Page 372	Material: SUS303 m1-3 Page 376	Material: CAC702 (A/BC2) m1-3 Page 378	Material: MC901 m1-3 Page 380

Worm Gears

KWGD/LKWGDLS Duplex Worms	AGDL Duplex Worm Wheels Reduction Ratio 20-60	KWG Ground Worm Shafts	AG Worm Wheels Reduction Ratio 10-60	AGF Worm Wheels Reduction Ratio 10-60	SWG Ground Worms	AG Worm Wheels Reduction Ratio 10-60
Material: SCM440 m1.5-4 Page 392	Material: CAC702 (A/BC2) m1.5-4 Page 392	Material: SCM440 m0.5-6 Page 400	Material: CAC702 (A/BC2) m0.5-1.5 Page 400	Material: CAC702 (A/BC2) m2-6 Page 404	Material: S45C m1-6 Page 410	Material: CAC702 (A/BC2) m1-6 Page 410
SW Worms	BG Worm Wheels Reduction Ratio 10-60	CG Worm Wheels Reduction Ratio 10-120	SUW Stainless Steel Worms	DG Worm Wheels Reduction Ratio 10-60	PG Worm Wheels Reduction Ratio 10-50	
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Gearboxes

PBX Miniature Bevel Gearboxes	KBX Bevel Gearboxes	CBX Bevel Gearboxes
Material: - Model L/T Page 442	Material: - Model L/T Page 446	Material: - Model L/T Page 450

Other Products

SRT/SRT-C Ratchets & Pawls	SRTB/SRT-C Ratchets & Pawls	GC/GC-I Gear Couplings	SV/SVI Involute Spine Shafts, Spine Bushings	GCU Gear Assembly Kit	DLS Rack & Pinion Lubrication System	Racks & Pinions Aluminum Frame Transport Device
Material: S45C P2.09-12.57 Page 458	Material: S45C P2.09-12.57 Page 460	Material: S45C Page 462	Material: S45C Page 464	Material: - Page 466	Material: - Page 468	Material: - Page 26

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H Hardened Plus **S** Semi-Custom **E** E Series

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	SSY	Spur Gears	148-151	
	STRCPF	Tapered Racks	272-273	
	STRCPFD	Tapered Racks	272-273	
	SUB	Stainless Steel Bevel Gears	358-359	
	SUKB	Stainless Steel Hubs	180	
	SUM	Stainless Steel Miter Gears	326-327	
	SUMA	Finished Bore Stainless Steel Miter Gears	326-327	
	SUN NEW	Stainless Steel Screw Gears	376-377	
	SUR	Stainless Steel Racks	246-247	
	SURCPF	Stainless Steel Racks	296-297	
	SURCPFD	Stainless Steel Racks	296-297	
	SURF	Stainless Steel Racks	246-247	
SURFD	Stainless Steel Racks	246-247		
SURO	Stainless Steel Round Racks	253		
SUS	Stainless Steel Spur Gears	154-159		
SUSA	Stainless Steel Spur Gears	156-159		
SUSF	F-Loc Gears	160-161		
SUSCP	Stainless Steel Spur Gears	296-297		
SUW	Stainless Steel Worms	434-439		
SV	Involute Spline Shafts	464-465		
SVI	Involute Spline Bushings	464		
SW	Worms	418-433		
SWG	Ground Worms	410-417		
Z	ZST	Hardened Ground Helical Racks	262	
	ZSTD	Hardened Ground Helical Racks	262-263	
	ZSTP NEW	Ground Helical Gears	262-263	
	ZST-GL	Assembly Gauges	264	
Racks & Pinions Transport Device NEW				26-27

KHK Product Introduction



—Anytime, Anywhere, Ready to Use—

KHK[®] Stock Gears

We respond immediately to customer needs with an abundant variety of 200 styles and 30,000 configurations.

As these items are always in stock, they can be used anytime, anywhere, when needed.

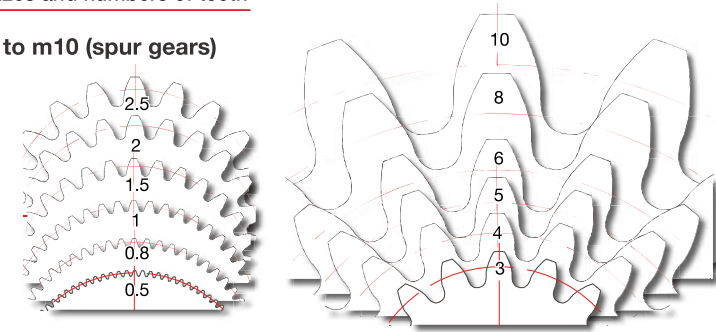
Abundant variety of gears



Large variety of sizes and numbers of teeth

Lineup from m0.5 to m10 (spur gears)

m	Minimum No. of teeth	Maximum No. of teeth
0.5	10	120
0.8	10	120
1	10	200
1.5	10	200
2	10	200
2.5	10	200
3	10	160
4	12	120
5	12	120
6	12	100
8	12	60
10	15	50



Full-scale drawing of teeth (spur gear)

Available in many materials

Choose based on your application.

We have a wide variety of standardized stainless steel and plastic products that can be used in places where rust and oil must be avoided, as well as metal products with increased gear strength.



Abundant inventory

We stock 5,000 configurations of product at all times in order to deliver them to you quickly.





Stock Gear Fastening Series



Key and screw fastening have been standardized.

If you require finished bore gears with keyways and tapped holes, please order the J Series products. Product bore size, keyway dimensions and tap sizes have all been standardized.

Allowable order sizes: **1 to 20 units** (1 to 5 units for module 4 or higher of SS, SSA, SSG, or SSAG).

For quantities that exceed the production limits, please request a price and delivery quote.

Order method: **Please specify Catalog No. + J + BORE.** (Example: For SS2-60, bore of $\phi 20 \Rightarrow$ SS2-60J20)

Production is completed in **2 working days** excluding the day ordered (**7 working days** for module 4 or higher of SS, SSA, SSG, or SSAG).



Gears can be installed in flexible positions. Gear teeth can be easily aligned.

If you require a locking hub, please order F Series.

Locking Hub and bore sizes have been standardized.

Allowable order sizes: **1 to 20 units.** For larger quantities, please request a price and delivery quote.

Order method: **Please specify Catalog No. + F + BORE + TYPE.**

(Example: For SSG2-40, bore of $\phi 20$, Type A \Rightarrow SSG2-40F20A)

Production is completed in **2 working days** excluding the day ordered.



Fits perfectly as the speed reducer pinion for servomotor.

If you require a flange type reducer pinion, please order R Series.

These products have standardized mounting hole specifications for flange.

■ Compatible speed reducer series

Manufacturer name	Nabtesco Corporation	Harmonic Drive Systems Co., Ltd.	Nidec Shippo Corporation	Sumitomo Heavy Industries, Ltd.
Speed reducer series	GH	HPG	VRG	IB

Allowable order sizes: **1 to 20 units.** For larger quantities, please request a price and delivery quote.

Order method: **Please specify Catalog No. + R + Mounting Hub Diameter.** (Example: SSG3-30, mounting hub diameter $\phi 32 \Rightarrow$ SSG3-30R32)

Production is completed in **2 working days** excluding the day ordered.

The J Series have keyways, the F & E Series have locking hubs, and the R Series have holes for Speed reducers. These 76 styles contain 18,700 configurations of gears that can be used immediately due to their standardized bore and keyway sizes.

Fastening Series / Semi-custom Lineup

Series	Type	Catalog Number	m0.5 (CP2.5)	m0.8	m1 (m1.25)	m1.5 (CP5)	m2	m2.5	m3 (CP10)	m4 (m3.5)	m5 (CP15)	m6 (CP20)	m8	m10		
J Series	Spur Gears	KSG														
		SSG														
		SSAG														
		KS														
		SS														
		SSA														
		SUS														
		SUSA														
		NSU														
		PU														
		PS														
		PSA														
		SUKB														
	Helical Spur Gears	KHG														
		MRCFD														
		KRGFD-H														
	Racks & Pinions	KRGFD														
		SRGFD(K)														
		KRFD-H														
		SRFD-H														
		SRFD-HL														
		KRED														
		SRAFD(K)														
		SRFD(K)														
		DRFD(K)														
		KRHGFD														
		ZSTP														
		ZSTD														
	CP Racks & Pinions	MRCGPFD														
		KSCPG														
		KRGCPFD-H														
		KRGCPFD														
		SSCPG														
		SRGCPFD														
		KRCPPFD-H														
		KSSCP														
		KRCPPFD														
		SSCP														
		SRCPFD-H														
		SRCPFD-HL														
	SRCPFD(K)															
	SUSCP															
	SURCPFD															
	Miter Gears	MMSG														
		SMSG														
Screw Gears	SN															
	SUN															
	AN															
	PN															
Worm Gears	SWG															
	SW															
	SUW															
	AG															
	BG															
	CG															
	PG															
	SRT															
Other Products	SRTB															
	GC															
F Series	Spur Gears	SSG														
		SS														
R Series	Spur Gears	SSA														
		SSG														
E Series	Spur Gears	SSCPG														
		ZSTP														
Semi-Custom	Spur Gears	SSG														
		SS														

* Each of the above products cannot be cancelled once ordered, as machining starts immediately after the order is received.

Definitively shortens the installation time

Bushing Fastening.
E Series

The lead time is **2** business days

Can be easily installed in 19 seconds using a single bolt

Time to mount a gear is reduced to 1/15



Concentricity:
0.02 mm



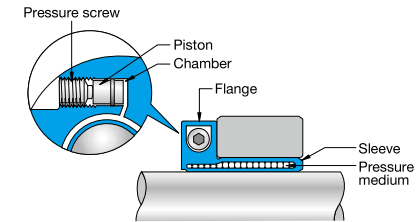
Solves the problems of gear fastening.

- Desire to reduce the time to mount gears.
When using the conventional wedge method, mounting a gear takes about 5 minutes (according to research by KHK), whereas these products can be easily mounted using one bolt in 19 seconds.
- Desire to reduce the assembly runout of the gears.
- Desire to reduce the backlash between the gear and shaft.
- Desire to lower the decrease in shaft strength due to fretting wear (worn or seized shaft).
- Desire to simplify the phase matching and positioning.

How the ETP-E Plus works

The pressure medium in the chamber is compressed as a result of tightening the screw.

The resulting pressure causes the hub side to expand into the hub and the bore side to expand onto the shaft. Thus allowing the shaft and the hub to be securely fastened.



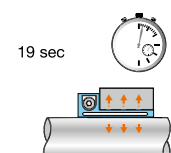
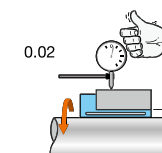
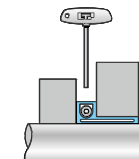
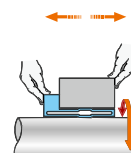
Effects of ETP-E Plus

Easy and accurate positioning

Helps save space

High concentricity

Secure and speedy installation



KHK Lineup

See Page 80

SSG Ground Spur Gears Series

Precision: N7
Material: S45C **1000 configurations**
Heat Treatment: Gear teeth induction hardened



m1.5 to 6

Limited release on the Japanese website

KHG Ground Helical Series

Precision: N6
Material: SCM440 **500 configurations**
Heat Treatment: Thermal refined / gear teeth induction hardened



m2 to 3

AGF Worms & Wheels Series

Precision: KHK 2 **230 configurations**
Material: CAC702 (A & BC2)



m2 to 6

- ZSTP 2 to 6, 110 configurations
- AGDL 2 to 4, 180 configurations
- AG 2 to 6, 330 configurations

Allowable Order Sizes

1 to 20 units. For quantities over 20, please request price and delivery quotes.

Ordering Method

Catalog Number + E + Bore Size (Example: SSG2-25E + BORE)

Production is completed in 2 working days excluding the day ordered.



Positive lock is also available at KHK Quick-Mod Gears.

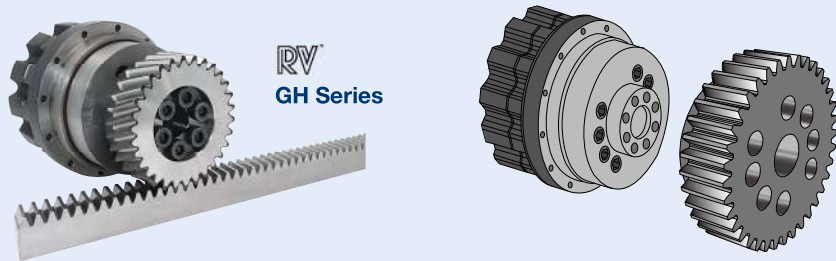
Superior compatibility with servos for speed reducers



We recommend ideal pinions for speed reducers

J Series R Series Even broader lineup!

Perfect for Nabtesco Corporation's GH Series **Nabtesco + R**



Flange attaching speed reducer pinions **R Series**

Nidec Shimpo Corporation



VRG Series

IB Series

HPG Series

Also perfect for shaft type speed reducers **J Series**

Nissei
株式会社 ニッセイ

Inline
APG Series

Right Angle
AFC Series



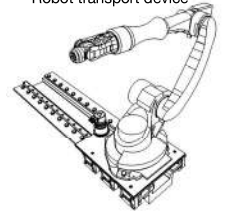
Pinion gear applicability table for Nabtesco GH Series **Nabtesco + R**

Corresponding speed reducer size and pinion gears See Page 92 for more details

Nabtesco GH Series	KHK target products		
	Module Type	CP Type	Helical Type
7	SSG3-30RGH7	SSCPG10-30RGH7	ZSTP3-30LRGH7
17	SSG3-40RGH17	SSCPG10-40RGH17	ZSTP3-30LRGH17
24	SSG4-30RGH24	SSCPG15-30RGH24	ZSTP4-30LRGH24
40	SSG5-30RGH40	SSCPG15-30RGH40	ZSTP5-24LRGH40
100	SSG6-30RGH100	SSCPG20-30RGH100	

Application examples

- Robot transport device



Series for flange output speed reducers **R Series**

Rack and pinion for corresponding flange output speed reducers See Page 90 for more details

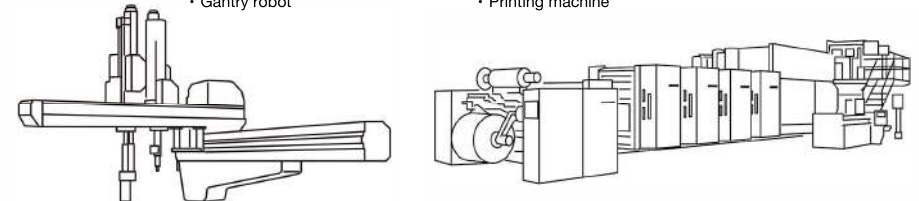
Mounting hub dia. H (Common to all speed reducers)	Nidec Shimpo VRG Series	Sumitomo Heavy Industries IB Series	Harmonic Drive Systems HPG Series	R Series Catalog Numbers	KHK recommended mating rack
24	C90	P120	20	SSG Module - No. of teeth	R24
32	D120	P130	32		R32
47	E170	—	50		R47
60	—	—	65		R60

R series catalog numbers are composed as follows :
(Base SSG ground spur gear catalog number) + R + (mounting hub diameter)

Application examples

- Gantry robot

- Printing machine



Series for shaft output speed reducers (with key) **J Series**

Pinion gears corresponding to speed reducer sizes See Page 62 for more details See Page 52 for more details

Nissei APG · AFC Series		KHK target products	Nissei APG · AFC Series		KHK target products	
Capacity	Frame No.	Catalog Number	Capacity	Frame No.	Catalog Number	
100W	12	SSG2-19J12	750W	18	KSG2-32J18	
	15	SSG2.5-19J15		22	KSG3-25J22	
	18	SSG2.5-24J18		28	KSG3-32J28	
200W	12	SSG2-19J12	1000W	22	KSG3-25J22	
	15	SSG2.5-19J15		28	KSG3-32J28	
	18	KSG2-32J18		1500W	22	KSG3-25J22
	22	KSG3-25J22			28	KSG3-32J28
400W	12	SSG2-19J12	2000W	22	KSG3-25J22	
	15	SSG2.5-19J15		3000W	28	KSG3-32J28
	18	KSG2-32J18			3000W	22
	22	KSG3-25J22		28		KSG3-32J28

When a key is not needed, try the locking hub series!



Be sure to calculate the strength under actual usage conditions before use.

Trusted secondary operations guaranteed by KHK.

We deliver them as **"complete products"**.

KHK Quick-Mod Gears



Three benefits of using the KHK Quick-Mod Gears

Wide range of secondary operations

We accept various machining including bore and mounting hole machining, Helisert machining, stepped hole machining and hub removal.



Helisert Processing



Stepped Hole Machining



Holes, Hubs, Keyway Machining



Various Mounting Hole Machining

Fast delivery available

We use high-precision machines in-stock "stock gears" on the JIT production line and deliver them with a short turnaround.



Warehouse of KHK Stock Gears



JIT Production Line



Inspection and Packaging



Shipping

Surface Treatments Offered

We accept requests for various types of plating. We offer platings that are suitable for rust prevention, solid lubrication for wear resistance and various other surface treatments.

■ Electro-galvanizing



A typical plating method for the purpose of preventing rust on iron, with plating thickness of about 2 to 25 μ m. Black trivalent chromate is RoHS compliant.

■ Black chromate



Black or slightly reddish plating. Black trivalent chromate is RoHS compliant.

■ Black oxide



Chemical change due to a strongly alkaline treatment. An iron phosphate chemical conversion liquid forms a ferrosulfuric oxide film (3 μ m or less).

■ Phosphate treatment



An iron phosphate chemical conversion treatment that forms a thin iron amorphous film.

■ Unichromate



A bluish silver-white plating. Trivalent chromate is RoHS compliant.

■ Electroless nickel plating



Plating with thickness of 3 to 10 μ m with uniform film thickness.

■ Low-temperature black chrome plating



A black chromium film (1 to 2 μ m) unlikely to peel away.

Note: Keep in mind that the product size of surface treatment with thick plating is the size before plating.

When Placing Orders

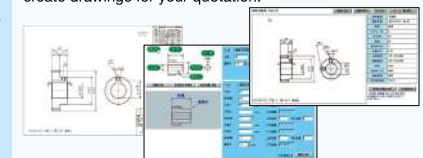
For quotation of secondary operations on standard products (KHK Quick-Mod Gears), please prepare a drawing with desired specifications. We will manufacture to the drawing after discussing prices and lead times.

<Cautions regarding Manufacturing>

- Please note that we do not perform black oxide processing after additional machining.
- Gear precision may be reduced, depending on the additional machining specifications. Please contact us when requesting a quote for information about post-machining gear precision.

Please include a drawing with your request.

Use the Drawing Creation Tool from the Web Catalog to create drawings for your quotation.



URL <https://khkgears.net/new/>

Custom Order

Second operations available

Custom Gears

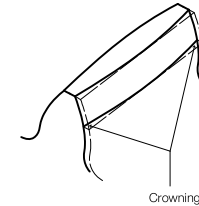


Machining Range

Flat/Helical Gears	Racks	Internal Gears	Screw Gears	Miter/Bevel Gears	Worm Gears
					
Module 0.5-10 Outer diameter ϕ 500 mm or less Weight 200 kg or less	Module 0.5-16 Total length 2,000mm or less Weight 60kg or less	Module 0.5-4 Tooth diameter ϕ 150mm or more Outer diameter ϕ 500 mm or less Weight 40kg or less	Module 1-4 Outer diameter ϕ 600 mm or less Weight 200 kg or less	Module 1-10 Outer diameter ϕ 250 mm or less Mounting distance 170 mm or less Weight 50kg or less	Module 0.5-10 Worm outer diameter: ϕ 100 mm or less Wheel outer diameter: ϕ 600 mm or less Mounting distance 350mm or less

Machining Example

Crowning



Crowning

Chamfering



Wire Cutting



Gear Specifications	
Shape	Spur Gears
Pitch	m2
No. of teeth	59
Material	S45C
Outside dia.	ϕ 122
Remarks	Teeth Wire Cut

When Placing Orders

Please prepare your own drawings.

Quotations for made-to-print gears are limited to the "production range" above. When ordering, please prepare a drawing with the details of the "Items described in the product specifications" clearly stated. We will manufacture to the drawing after quoting cost and lead time.

<Cautions regarding Manufacturing>

- Even if an order is within the manufacturing range, it may not be manufacturable depending on the specifications such as accuracy, shape and heat treatment.
- Gears for which we have the technological capacity may be unavailable due to the circumstances of our production processes and capabilities.
- We may provide a quotation with the customer's accuracy requirements changed according to our manufacturing capacity. Please check your quotation before placing an order.
- Designs with no product specifications listed on the drawing, or details of quality requirements, will be manufactured based on the ISO9001 quality system.
- We do not conduct any design work for custom ordered gears. We manufacture only to customer drawings.

■ Items described in the product specifications ● Requirement ○ As required △ Contact us - Not required

Listed Details	Gear Type		Internal Gears	Helical/Bevel Gears	Racks	Helical Racks	Bevel Gears	Spiral Bevel Gears	Worm Gears
	Spur Gears	Helical/Bevel / Screw Gears							
Gear Accuracy	●	●	●	●	●	●	●	●	●
Pitch (m, CP, DP)	●	●	●	●	●	●	●	●	●
Pressure angle	●	●	●	●	●	●	●	●	●
Material	●	●	●	●	●	●	●	●	●
Shape dimensions / dimensional tolerance	●	●	●	●	●	●	●	●	●
Number of teeth / number of rows	●	●	●	●	●	●	●	●	●
Spiral angle / spiral direction	-	-	-	-	-	-	-	-	●
Teeth depth / backlash	○	○	○	○	○	○	○	○	○
Heat treatment / surface treatment	○	○	○	○	○	○	○	○	○
Surface roughness	△	△	△	△	△	△	△	△	△
Geometric tolerance	△	△	△	△	△	△	△	△	△
Number of teeth/rows of the pattern mounting distance	-	-	-	-	-	-	-	-	-

Note: Tooth thickness or backlash that is not specified will be produced in accordance with KHK stock gears. If prior discussion is not possible, they will be detailed in the quotation.

Racks & Pinions Aluminum Frame Transport Device

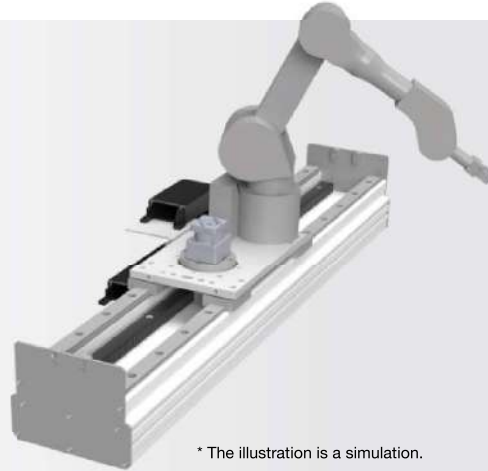
With design support. Easy installation. Labor-saving.
High-speed transfer up to the maximum stroke of 3800 mm.

Transport Device Example

RU-800-H

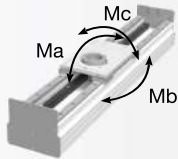
Maximum Payload (Horizontal)	60 kg (reduction ratio: 1/5*)
Stroke	800mm
Repeated Positioning Accuracy	±0.3mm
Max. Speed	1,000 mm/sec
Total Length	1218mm

* Mitsubishi HG-KR43 (400W), acceleration of 0.3G, during operation



* The illustration is a simulation.

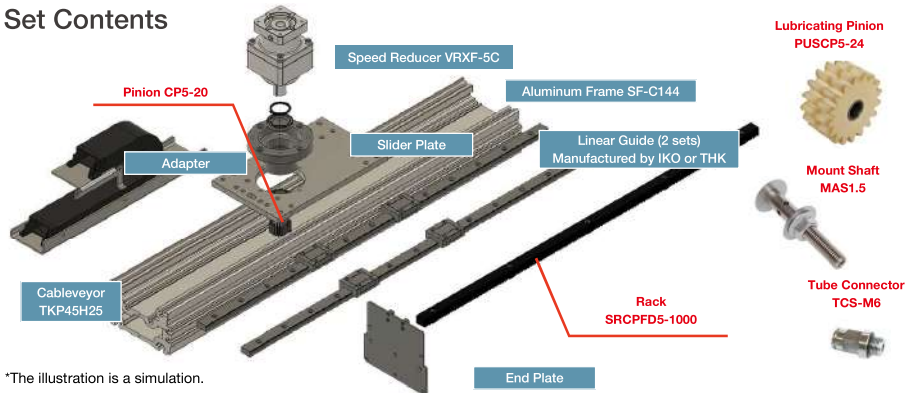
Static Allowable Moment Ma	2107Nm
Static Allowable Moment Mb	2107Nm
Static Allowable Moment Mc	2340Nm
Total Length	1218mm
Frame Length	1200mm



Reduction ratio	Max. Speed (mm/sec)	Max. Payload (kg)
1/3	1666	15
1/5	1000	60

* Robots, motors, controllers, etc. are not included.

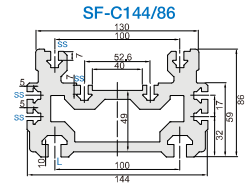
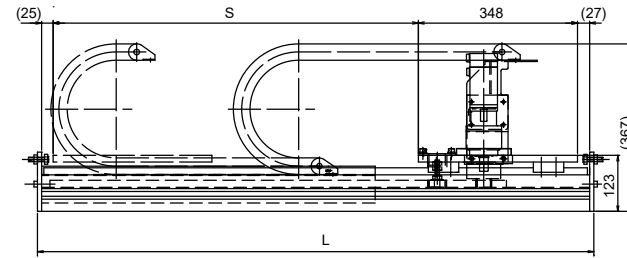
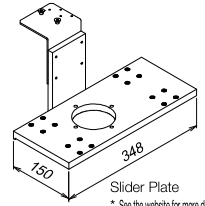
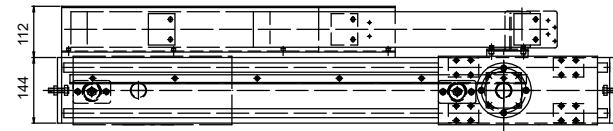
Set Contents



*The illustration is a simulation.

Product Features

- ① The maximum stroke can be freely set within 3800 mm.
- ② Capable of transporting a wide range of light to heavy objects
- ③ Delivery time for the transport device in the example is 30 business days (discussion required when changing specifications)



Standard specifications

Model	Stroke: S (mm)	Total length: L (mm)
RU-800-□	800	1218
RU-1300-□	1300	1718
RU-1800-□	1800	2218
RU-3800-□	3800	4218

* Can be manufactured within the stroke range of 500 mm to 3,800 mm. The length is adjusted in 100 mm increments.

* □ contains "S" for reduction ratio of 1/3, and "H" for reduction ratio of 1/5.

* Shipping fee will be charged separately.

Application Examples



* Image courtesy of Hasegawa Machine Works, Ltd.

Standard equipment includes lubricating pinion



* Be sure to order flex pumps and tubes separately.

Case Study

FUKAGAWA 株式会社深川製作所様

株式会社 トパック 様

Ultra-high-speed Three-way Seal Bag Filling and Packaging Machine R

Automatic Size Cutting Device NAHC-F10



Gears Used
Uses SW worms and CG worm wheels for rib roll feeding

Machine Application
This device provides materials while correcting the bending of coiled material.

Features
Can automatically perform standard-length straight pipes cutting, stain removal and ribbing simply by entering the duct size

3-Roll for Square Elbow FBR-2000M



Gears Used
Uses SMA miter gears for bending moving steel plates

Machine Application
A square elbow forming machine that rolls and bends three iron plates

Features
It has a repeat function that sets the forming roll in the same position



Gears Used
MM, SM and SMB miters change the motion from the horizontal-shaft drive to the vertical-shaft drive, which is then transmitted to the filling device, and combined with SW worms and CG worm wheels to be used for adjusting the timing of filling while operating the filling device

Machine Application
Makes and fills bags at ultra-high speeds of 300 to 800 bags per minute
· A top-level automatic filling and packaging machine

Features
Ultra-high-speed filling and packaging is achieved by the use of rotary methods that make, fill and seal bags in the horizontal direction. In addition, the filling time can be extended to reduce the occurrence of biting into the seal, and the sealing time can be extended to achieving stable seal strength. Also, by combining with an integration device, the unit can be connected to carton making machines, horizontal pillow machines, banding machines, bag-feeding packaging machines, etc.

SAILOR セーラー万年筆株式会社様

Injection Molded Product Automatic Extractor sigma5

Gears Used
Used for the traveling shaft when extracting the ordered (custom-made) racks and pinions

Machine Application
A device used in plastic injection molding that extracts molded products from the molding machine and delivers them to a post-process such as a conveyor or machining machine installed next to the molding machine

Features
A rack and pinion mechanism is adopted that extracts and delivers at high speed and high accuracy, enabling modifications such as changing the direction of extraction.



MARUHIDE 株式会社丸秀工機様

Pipe Coaster HID-400MA,600MA, 1000MA,1500MA



Gears Used
Uses custom made-to-order racks and pinions made in the KHK Quick-Mod Gears (standard product given secondary operations) for the running shaft when cutting

Machine Application
Dimensional cutting, shape cutting (branch cutting / hole cutting), groove cutting and marking of pipes and steel pipe members used in industries such as shipbuilding, pressure vessels, water supply and sewage, steel structures, construction machinery and heavy electric machinery

Features
· Supports small-diameter pipes down to 25A to large-diameter pipes up to 1500A. · Supports various cut shapes and has a groove which enables speedy and highly accurate cutting.
· Can be used to cut not only steel pipes but also square steel pipes and other materials. · Facilitates data creation with the adoption of an interactive data input system.

Case Study 2

Hataly 株式会社 ハタリー 様

製粉トーキン 様 (広島県呉市)

Robot Slider RS1S

Short Column Groove Machining Machine SCB-1000 II



Gears Used
Uses SS Series within machining drive

Machine Application
Short column material, groove machining on both ends

- Features**
- Machining speed is the fastest in the industry
 - Significantly simplifies the setup
 - Supports corners of 250 to 1000 mm and a maximum plate thickness of 50 mm

H-section Steel Groove Machining Machine HQB-1055NL



Gears Used
Uses SWG worms and AG worm wheels in machining drive gearboxes

Machine Application
Secondary operations of H-section steel grooves, scallops and driving


- Features**
- Supports non-scallop machining
 - Automated 3 shafts
 - High-rigidity frame
 - Reliable long-run model



Gears Used
SRCPF racks and custom-order CP spur gears are used for the traveling shaft

Machine Application
As a traveling device for various robots

- Features**
- Can be extended by 1.2m by combining 3 types of frames
 - Allows additional extension to be made to existing devices
 - Achieved the maximum track record of 40.8 m

 不二産業株式会社様

Lifter for switchboard



Gears Used
Use custom-made spur gears to raise and lower the lifter

Machine Application
Pulls out and stores devices such as circuit breakers and lightning arresters from the switchboard.

- Features**
Allows raising and lowering heavy luggage with human power.

MASUKO 増幸産業株式会社様

Super Mass-Colloider MKZA10-15JIV



Gears Used
Use custom-made spline shafts and spline hubs for the attrition shaft, and SB bevel gears for the manual grinding shaft

Machine Application
Food, spices, industrial raw materials, pharmaceuticals, cosmetics, etc.

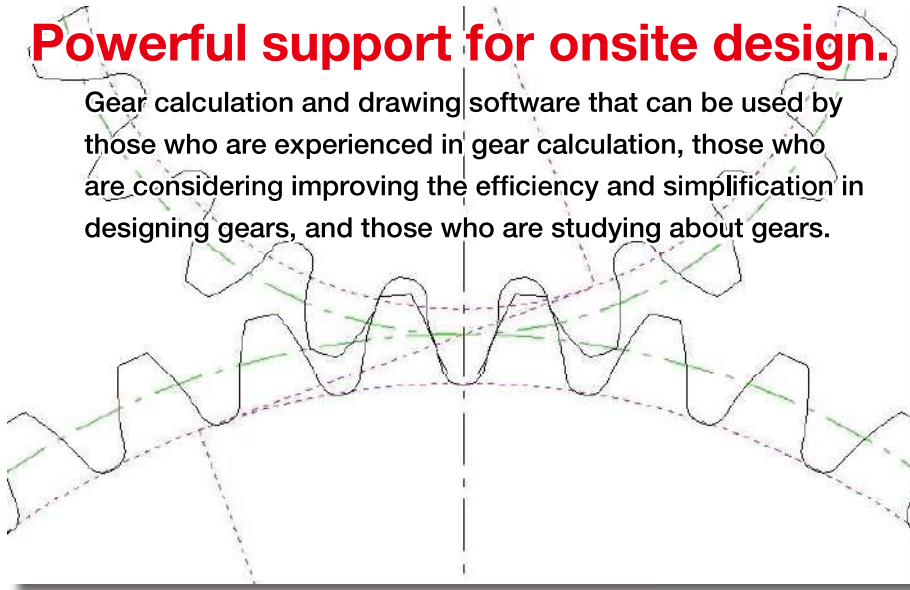
- Features**
Ultra-fine grain grinder. A stone mill type grinder that's capable of ultra-fine granulation that feels like melting.

Gear calculation software **GCSW** Free

& Gear drawing software **GDSW** for Web

Powerful support for onsite design.

Gear calculation and drawing software that can be used by those who are experienced in gear calculation, those who are considering improving the efficiency and simplification in designing gears, and those who are studying about gears.



Calculation Example

Calculation of dimensions and strength

Calculation of gear force

Backlash conversion

Calculation of gear array

Drawing Example

Spur gears, ground helical gears

Racks

Bevel Gears

Gear calculation software GCSW

Reduce the cost of designing gears with GCSW.



Calculation functions of GCSW	
Gear Type	Parallel axes: Flat/helical gears, internal gears, racks & pinions Intersecting axes: Mitters, bevel gears Skewed axes: Screw gears, worms & wheels
Calculation details	Various dimensional calculations (profile shift, tooth thickness, center distance) Strength calculation (bending strength, surface strength) Calculation of gear force (radial direction, thrust direction, radial direction) Gear tooth profile calculation (tooth profile drawing, creation drawing, meshing drawing) Backlash conversion, constraint meshing gear array calculation
Output Details	Printing various calculation results Printing tooth profile drawing and meshing drawing CAD data output of tooth profile drawing

Difficult calculations for gears such as gear shape, strength and tooth profile can be instantly made. In addition, it can simulate the dimensions and strength of desired gears, allowing the designing cost to be drastically reduced.

Gear drawing software GDSW

Basic gear drawings can be easily made using GDSW.



GDSW drawing functions	
Gear Type	Parallel axes: Flat/helical gears, internal gears, racks & pinions Intersecting axes: Mitters, bevel gears Skewed axes: Screw gears, worms & wheels
Drawing contents	Gear specifications (pitch, pressure angle, number of teeth, gear accuracy, material, heat treatment, etc.) Basic shape of various gears Shapes with/without hubs (2-step hub supported) Hole shape (3-step hole supported) Key groove shape (JIS key, optional key supported) Mounting hole shape (tap, drilled hole, counterbored hole)
Output Details	Printing gear drawings CAD data output of drawn gears (ZIP supported)

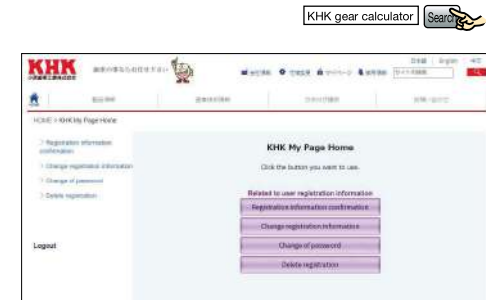
It can be used to make drawings with basic gear shapes without needing CAD software. Drawings of spur gears, bevel gears, worm gears and the like can be printed and CAD data can be created.

Usage

Please register as a user.

KHK software can be used for free, but registration is required. When user registration is completed, "KHK My Page" is created and GCSW and GDSW become available. For details, please see our web site.

* We carefully manage customer data based on our personal information protection policy



<Cautions regarding Manufacturing>

- Software contents and terms of use are subject to change without notice.
- No compensation will be provided for any loss which might be caused by bugs in the software.
- The gear strength formula of GCSW is based on JGMA (Japanese Gear Manufacturers Association) specifications.
- Drawings drawn by GDSW may not be manufacturable due to our production capacity.

Delivery Date Guide

*The delivery date excludes the day ordered, and shipping is made on the next business day. Because the machining starts immediately, we cannot accept cancellations for the products below.

Shipping Date	4 days later ... 6 days later ... 9 days later ... 17 days later ... 27 days later ... 37 days later	Maximum order size
J Series	2 Business Days Shipping Date	20
J Series Module Over m4	7 Business Days Shipping Date	5
F Series	2 Business Days Shipping Date	20
E Series	2 Business Days Shipping Date	20
E Series Module Over m4	7 Business Days Shipping Date	5
R Series	2 Business Days Shipping Date	20
焼入+ プラス	4 Business Days Shipping Date	-
焼入+ プラス J Series	6 Business Days Shipping Date	20
焼入+ プラス J Series Module Over m4	11 Business Days Shipping Date	5
Semi-Custom Standard Product SS	About 15 Business Days Shipping Date	5
Semi-Custom Standard Product SSG	About 25 Business Days Shipping Date	5
Semi-Custom J Series SS	About 25 Business Days Shipping Date	5
Semi-Custom J Series SSG	About 35 Business Days Shipping Date	5

- J Series / E Series
Production is completed in 2 working days excluding the day ordered for products with module 3 or under, and 7 days for products with module 4 or higher.
- F Series / R Series
Production is completed by the manufacturer in 2 working days excluding the day ordered.
- Hardened Plus
Production is completed by the manufacturer in 4 working days excluding the day ordered.
- Hardened Plus + J
Production is completed in 6 working days excluding the day ordered for products with module 3 or under, and 11 days for products with module 4 or higher.
- Semi-custom order / Semi-custom order J series (SS)
Semi-custom standard products will be completed in about 15 business days excluding the day ordered, and semi-custom J Series products will be completed in about 25 business days excluding the day ordered.
- Semi-custom order / Semi-custom order J series (SSG)
Semi-custom standard products will be completed in about 25 business days excluding the day ordered, and semi-custom J Series products will be completed in about 35 business days excluding the day ordered.



KHK was designated as a partner company for Sainokuni, an industrial development project organized by Saitama Prefecture in Japan.

KHK Group

Kohara Gear Industry Co.,Ltd.

Design, manufacture and sales of KHK stock gears
Order and manufacture of various order-made gears

KHK Noda Co.,Ltd.

Manufacture/sales of gears and stock gears

KHK CO., LTD.

Purchase/sales of gears and variable speed reducers
Trade in transmission items

Sales Overseas

KHK's global network is built throughout the world. See the website for details on each country and region.



Factory Introduction



JIT Line



Lathe



Tooth Cutting



Grinding Operations



Machining



Wire Cutting



Quality Assurance / Inspection



Warehouse of KHK Stock Gears

Production Equipment



Combined Machining Machine (INTEGREX J-200)



Vertical Machining Center (SVC2000)



Plane / Inner Surface Combined Grinding Machine (NWGII-5T)



CNC Hobbing Machine (KN-152)



Hobbing Board (KL-451)



Gear Grinding Machine (VIPER500W)



Wire Electric Discharge Machine (C-600IA)



Combined Machining Machine (DMU 85 FD monoBLOCK)

KHK Noda Co., Ltd.



KHK Noda Co., Ltd. 143 Nakazato, Noda-shi, Chiba, 270-0237



Quality Assurance



Carl Zeiss 3D Coordinate Measuring Machine (ACCURA)

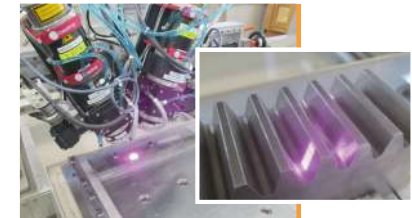


Gear Measuring System (3500MS)

Hardening Equipment



Induction Hardener (MK16A STAT300-50)



Laser Hardener (LDF4000-40)

Production Equipment



Rack Grinding Machine (ZSM Compact 2200)



NC Precision Plane Grinder (PSG206Q)



CNC Hobbing Machine (KN-152)



CNC Gear Grinding Machine (300TWG)



CNC Bevel Gear Grinding Machine (PH-280HG)



Vertical Machining Center (VCN-530Q)



CNC Screw Grinding Machine (TE-LM200)



CNC Lathe (MW120EXG)

All KHK stock gears conform to the RoHS2^{*1} Directive.

^{*1} The RoHS2 Directive (2011/65/EU) was revised on July 22, 2019 to a total of 10 substances with 4 phthalates added.

RoHS2 Directive

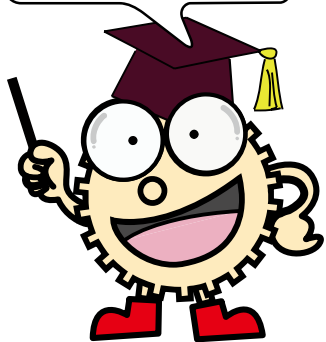
Restriction of Hazardous Substances
Restriction of Hazardous Substances

The RoHS Directive is a law established by the European Union (EU) that restricts the use of certain hazardous substances in electronic and electrical equipment. The use of the 10 environment-related substances specified below is restricted.

Maximum allowable concentration of 10 environment-related substances

- Cadmium:** 0.01wt% (100ppm)
- Lead:** 0.1 wt% (1000ppm)
*Exception depending on usage
Steel 0.35 wt%, Aluminum 0.4 wt%, Copper alloy 4 wt%
- Mercury:** 0.1 wt% (1000ppm)
- Hexavalent chromium:** 0.1 wt% (1000ppm)
- PBB (Polybrominated biphenyl):** 0.1 wt% (1000ppm)
- PBDE (Polybrominated diphenyl ether):** 0.1 wt% (1000ppm)
- DEHP (Di-2-EthylHexyl Phthalate):** 0.1 wt% (1000 ppm)
- BBP (Butyl Benzyl Phthalate):** 0.1 wt% (1000 ppm)
- DBP (DiButyl Phthalate):** 0.1 wt% (1000 ppm)
- DIBP (DiIsoButyl Phthalate):** 0.1 wt% (1000 ppm)

Cadmium and hexavalent chromium: Environmentally damaging substances are not used.



The material components of KHK stock gears are managed in a database.




* The mill sheet is an attached document that guarantees the steel material.
* SDS refers to safety data sheets.


We have created a database of materials used in KHK stock gears, black dye, rust preventive oil used in products, mill sheets and SDS for packaging materials in effort to create environmentally friendly products.

Improving environmental (quality, safety, cost) aspects through design, manufacturing and sales activities of KHK stock gears


- Press ahead with employing "dry-cut" gear cutting methods.




Results
Preventing air pollution due to oil smoke, not using cutting oil (resource-saving), shortening machining time by high-speed gear cutting (saves energy, shortens manufacturing lead time)
- Adiabatic films covering windows and adiabatic paint applied on the roof of our building



Results
It blocks heat from the outside during summer and insulates heat inside during winter, reducing the amount of electricity used by the air conditioner.
- The choice of hybrid cars and idling stop cars



Results
We are working to reduce the environmental burden by using hybrid and idling-stop vehicles.
- Solar panels placed on the roof of our building (10kW-Rated)



Results
60 solar panels on the roof reduced 1.89 tons of CO2 emission per year. CO2 emissions are known to be contributors to global warming.

ISO14001 environmental management system certification acquired

KHK has established an integrated management system not only to provide quality assurance to our customers but also to conduct environmentally conscious corporate activities and continuous improvement activities that involve all our employees in order to increase stakeholder satisfaction, as well as to establish and promote a system that provides highly economic results.




At KHK, we strive to fulfill our motto "to provide quality products that are trusted by customers," acquiring the international standard quality management system ISO9001 certification and the environmental management system ISO14001 certification. Also, in order to increase customer satisfaction, we have established an integrated management system of "Vision, Plan, Do, Check and Action" cycles to continuously improve the work structure and offer safer and better products speedily and cheaply. We also work hard to further improve our service so that our customers can use KHK products with peace of mind.


KHK Environmental Practices

Treatment after use of KHK stock gears and packaging materials


- Steel Products




Recycle metal products as scrap metal according to the material.
- Nylon Gears




Nylon gears are plastic waste. Please dispose of as reusable industrial waste.
- Cardboards



Treat the cardboard used in the packaging as recycled cardboard.
- Paperboards



Treat the cardboard used in the packaging as recycled paper.
- Plastics



Packing materials like foamed polyethylene sheets and plastic boxes are plastic waste. Please dispose of as reusable industrial waste.

SDS Activities

The materials and products used for KHK stock gears, the rust preventive oil and packaging materials, and the auxiliary materials used in the manufacturing process are managed in the safety data sheet for chemical substances, etc., in consideration of the global environment.

Green Purchasing Activities

90 percent of office supplies we purchase are made of environmentally friendly materials.



Discontinued Stock Product Model Number History Table

Category	Discontinued Products		Specifications		Alternative	Sales Period A.D.
	Item	Range	Characteristics	Material	Item	
Spur Gears	MSG/MSGB	Module 1, 1.5, 2, 2.5, 3, 4	Carburized	SCM415	Custom order	1978~2020
	SSG	Some products of module 0.5, 0.8	Finished	S45C	Custom order	2008~2019
	SSS	Module 0.5, 0.8, 2, 2.5, 3	Shaft Type	S45C	Custom order	2008~2020
	SS	Some products of module 0.5, 0.8, 1, 1.5	Finished	S45C	Made to Order / Secondary Operations	2008~2020
	SSY	Some products of module 0.8, 1, 1.25	With Hub	S45C	Custom order	1984~2020
	SSAY	Module 1.25	Hubless	S45C	Custom order	1988~2008
	SSAY/K	All	K clamp (patented)	S45C	No production	2002~2017
	SSH	All	Honing treatment on Tooth Surface	S45C	SSG	1973~1975
	LS	m0.5-25,40 m0.8-25,40,60,70,80	Sintered item	SMF5040	SS	2000~2014
	CS	All	Molded	FC200	SS	1973~1984
	SUSL	All	F-loc	SUS303	SUSF	1996~2016
	DSL	All	F-loc	Acetal (SUS303)	DSF	2000~2016
	PSU	All	With core hub	MC901 (FC200)	PU	1988~1996
	DS	m0.5-18,25,28,32,35,36,64,72 m0.8-18,25,28,32,35,36,64,72	Molded item	Duracon (R) (M90-44)	Custom order	1988~2017
	BSS	Some products of module 0.5, 0.8, 1	Finished	C3604	Made to Order / Secondary Operations	2008~2020
	MSCPG	All	Carburized	SCM415	Made to Order	2014~2020
KSCP	All	Thermal refined, gear teeth induction hardened	SCM440	KSP Hardened Plus	2014~2019	
Helical Gears	KHCPG	All	CP, Ground	SCM440	Custom order	1992~1992
	KHG	Some products of module 1, 1.5, 2, 2.5, 3	Transverse modules, ground gears	SCM440	Custom order	1989~2019
Internal Gears	CI	All	Molded	FC200	SI	1973~1978
Racks	KRG	All 500mm	Thermal Refined, Ground	SCM440	KRGF	1984~2020
	KRGD	All	Thermal Refined, Ground	SCM440	KRGFD-HJ	1984~2019
	SR	Lengths over 1000 mm	Common Type	S45C	SRF	1973~2008
	SUR	Lengths over 1000 mm	Stainless Steel	SUS304	SURF	2004~2020
	PR	Lengths over 1000 mm	Plastic	MC901	PRF	1984~2020
	BSR	Module 1.25	Contains Brass	C3604	Custom order	1984~2008
	SRO	SRO6-1000	Round Racks	S45C	Custom order	1989~2019
	CR	All	Molded	FC200	SRF	1973~1978
	KRGCP	All 500mm	Thermal Refined, Ground	SCM440	KRGCPF	1986~2020
	KRGCPD	All	CP, Thermal Refined, Ground	SCM440	KRGCPD-HJ	1984~2019
SRCP	Lengths over 1000 mm	CP	S45C	SRCPF	1978~2008	
Helical Racks	KRHGCPF	All	CP, Ground	SCM440	Custom order	1992~1992
Spiral Miter Gears	SMS	Module 1.25	Common Type	S45C	Custom order	1978~2006
	KSP	F Type (Finished Products with Key Groove) All Products, Parts of m2 to 6	Finished	SCM415	Made to Order / Secondary Operations	2004~2020
Straight Miter Gears	CM	All	Molded	FC200	SM	1973~1978
	FM	All	Precision Molded	S45C	SM	1973~1978
Ground Zero Miter Gears	SMZG	All	Thermal refined, gear teeth induction hardened	S45C	Custom order	2010~2020
High-Ratio Hypoid Gears	MHP	Reduction ratios 90, 120, 180, 200, 20 (m1), 30 (m1.5)	High reduction ratio with a pair of gears	SCM415	No production	2000~2016
Spiral Bevel Gears	MBSA	Some products of module 1.5 or less, 2, 2.5, 3, 4, 5, 6	Finished	SCM415	Custom order	1978~2020
	MBSB	Some products of module 1.5 or less, 2, 2.5, 3, 4, 5, 6	Finished	SCM415	Custom order	1978~2020
	KSP	F Type (Finished Products with Key Groove) All Products, Parts of m2 to 6	Finished	SCM415	Custom order	2004~2020
Straight Bevel Gears	FB	All	Precision Molded	S45C	SB	1973~1978
	SB	CB gear mating pinions with module over m5	Common Type	S45C	SBY	1973~2006
	CB	All items having SB	Molded	FC200	SB, SBY	1973~2000
	CB	SB mating gears with module over m5	Molded	FC200	SB, SBY	1973~2006
Ground Zero Bevel Gears	SBZG	All	High reduction ratio with a pair of gears	S45C	Custom order	2010~2020
Screw Gears	AN	Module 4	Contains Aluminum Bronze	CAC702 (AIBC2)	SN	1979~2019
	KWGDL	Module Over m5	Duplex, Ground	SCM440	Custom order	1988~2002
Worms	KWGDLs	Module Over m5	Duplex, Ground Shaft	SCM440	Custom order	1992~2002
	KWG	Right-hand helix with double threads with module over m5 (R2)	Ground Shaft	SCM440	Custom order	1978~2002
	SW	Left-hand helix with module over m4 (L1, L2)	Common Type	S45C	Custom order	1996~2002 m4 is 1996~2019
Worm Wheels	AGDL	Module Over m5	Duplex	CAC702 (AIBC2)	Custom order	1988~2002
	AGF	Right-hand helix with double threads with module over m5 (R2)	Contains Aluminum Bronze	CAC702 (AIBC2)	Custom order	1978~2002
	BG	Left-hand helix with module over m4 (L1, L2)	Contains Phosphor Bronze	CAC502 (PBC2)	Custom order	1996~2002 m4 is 1996~2019
	CG	Module Over m1.5	Molded	FC200	Custom order	1996~2020 m4 is 1996~2019
Other Products	GC	All TK	Gear Couplings	S45C	GC-J	1975~2020
One-cycle-clutch type geared motor	F	All	Without motor		No production	1973~1980
	IM	All	With motor		No production	1973~1980
	M	All	With motor		No production	1973~1980
Gear calculation software	GCSW	All	General gear calculation		Online GCSW	1988~2009
Electronic catalog (Japanese version only)	30XX	All	Product information for KHK stock gears DF, strength calculation, etc.		Web catalog	1992~2011